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ABSTRACT

Since 1994, the National Center for Education Statistics (NCES) has surveyed nationally representative samples of approximately 1,000 public schools in the fall of each academic year on Internet access and, since 1996, on the types of Internet connections used. The most recent survey of Internet access indicates that public schools in the United States have nearly reached the goal of connecting every school to the Internet. In 1994, 3% of all U.S. public school instructional rooms were connected to the Internet; by 1999, 63% were connected. In 1999, the ratio of students per instructional computer was approximately 6, the same as 1998, which is above the stated "reasonable level" of 4 to 5. In 1996, dial-up network connections were used by almost three-quarters of public schools. By 1999, more schools were using faster dedicated-line network connections; 63% of public schools were connected to the Internet by dedicated lines, 14% using dial-up connections, and 23% using other connection types. The survey listed several potential sources of financial support; about 9 out of 10 schools reported receiving support from their school district, and 72% from state or federal government programs. About one third of schools reported receiving support from parents and parent organizations, and about the same percentage received support from businesses. Fifteen percent of schools received support from teachers or students, while five percent received support from other programs or individuals. (AEF)

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Internet Access in U.S. Public Schools and Classrooms: 1994-99. Stats in Brief

By Catrina Williams

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NATIONAL CENTER FOR EDUCATION STATISTICS

Stats *in Brief*

Internet Access in U.S. Public Schools and Classrooms: 1994–99

February 2000

In 1994, the White House's National Information Infrastructure (NII) initiative challenged the nation's schools and classrooms to connect to the Internet by the year 2000. In that year, the U.S. Department of Education commissioned the National Center for Education Statistics (NCES) to track the rate at which public schools and classrooms were meeting this goal. Since 1994, NCES has surveyed nationally representative samples of approximately 1,000 public schools in the fall of each academic year on Internet access and, since 1996, on the types of Internet connections used.

How much progress have public schools made connecting to the Internet?

The most recent survey of Internet access indicates that public schools in the United States have nearly reached the goal of connecting every school to the Internet. The percentage of public schools connected to the Internet has increased each year, from 35 percent in 1994 to 95 percent in 1999 (table 1).

In earlier years, access to the Internet varied by school characteristics. In some previous surveys, for example, secondary schools, schools with lower concentrations of students in poverty (as measured by eligibility for free or reduced-price lunches), and suburban schools were more likely to have Internet access than other schools. By 1999, these differences had disappeared; all schools, regardless of level, poverty concentration, and metropolitan status, were equally likely to have Internet access.

How much progress have public schools made in connecting classrooms?

In 1994, 3 percent of all U.S. public school instructional rooms[1] were connected to the Internet, by 1999, 63 percent were connected. Classroom connectivity is expected to continue to grow due to the allocation of funds through the Education rate (E-rate) program, which was established to make services and technologies in telecommunications available to schools and libraries at discounted rates based upon the income level of the students in their community and whether their location is urban or rural. The poorest applicants receive the largest discounts (90 percent) and rural communities receive up to a 10 percent additional discount. As of November 22, 1999, $1.9 billion[2] has been committed to E-rate programs throughout the nation.

Differences by school characteristics remain regarding Internet access in instructional rooms (table 1). For example, 39 percent of instructional rooms had Internet access in schools with high concentrations of poverty (71 percent or more students eligible for free or reduced-price lunches), compared with 62 to 74 percent of instructional rooms in schools with lower concentrations of poverty. The percentage of instructional rooms with Internet access in public schools with high concentrations of poverty did not increase between 1998 and 1999, while there were increases in the percentage of connected instructional rooms in schools with lower concentrations of poverty.

What is the ratio of students per computer?

According to the President's Committee of Advisors on Science and Technology (1997, 21), 4 to 5 students per computer is the ratio "that many experts consider to represent a reasonable level for the effective use of computers within the schools." In 1999, the ratio of students per instructional computer in public schools was approximately 6, the same as 1998 (not shown). Overall, within types of schools, ratios of students to instructional computer stayed the same or decreased slightly between 1998 and 1999.

The ratio of students per instructional computer *with Internet access* decreased from 12 to 9 from 1998 to 1999, although differences remain across schools with different characteristics (table 1). For example, medium-sized and large schools had more students per computer with Internet access than small schools, 9 and 10 students compared to 6 students. Schools located in cities had more students per computer with Internet access (11) than schools in rural areas (7). The largest differences occurred in schools with

[1] Instructional rooms include classrooms, computer and other labs, library/media centers, and any other rooms used for instructional purposes.

[2] The "Year 2 Funding Commitment Data" was found at the Schools and Library Division (SLD) of the Universal Service Administration Company website, http://www.sl.universalservice.org/apply/fcyear2/national.asp.

Table 1.—Percent of public schools with Internet access, percent of instructional rooms with Internet access in public schools, and ratio of students per instructional computer with Internet access, by school characteristics: Selected years 1994 to 1999

School characteristics	Percent of public schools with Internet access				Percent of instructional rooms with Internet access in public schools				Students per instructional computer with Internet access	
	1994	1996	1998	1999	1994	1996	1998	1999	1998	1999
All public schools	**35**	**65**	**89**	**95**	**3**	**14**	**51**	**63**	**12**	**9**
Instructional level[1]										
Elementary	30	61	88	94	3	13	51	62	13	11
Secondary	49	77	94	98	4	16	52	67	10	7
Size of enrollment										
Less than 300	30	57	87	96	3	15	54	71	9	6
300 to 999	35	66	89	94	3	13	53	64	12	9
1,000 or more	58	80	95	96	3	16	45	58	13	10
Metropolitan status										
City	40	64	92	93	4	12	47	52	14	11
Urban fringe	38	75	85	96	4	16	50	67	12	9
Town	29	61	90	94	3	14	55	72	12	8
Rural	35	60	92	96	3	14	57	71	9	7
Geographic region										
Northeast	34	70	90	94	3	10	39	56	13	9
Southeast	29	62	92	98	2	10	51	60	12	10
Central	34	66	90	93	3	19	61	70	10	7
West	42	62	86	95	5	15	51	68	14	10
Percent of students eligible for free or reduced-price school lunch										
Less than 11 percent	40	78	87	94	4	18	62	74	10	7
11 to 30 percent	39	72	94	96	4	[2]18	53	71	11	8
31 to 49 percent	33	62	94	98	2	[2]12	61	68	11	9
50 to 70 percent	31	53	88	96	4	[2]12	40	62	16	10
71 percent or more	19	53	80	90	2	[2]5	39	39	17	16

[1] Data for combined schools are included in the totals and in analyses by other school characteristics but are not shown separately.

[2] Revised from previously published figures.

SOURCE: U.S. Department of Education, National Center for Education Statistics, *Advanced Telecommunications in U.S. Public Schools, K–12*, NCES 95–731; *Advanced Telecommunications in U.S. Elementary and Secondary Public Schools, Fall 1996*, NCES 97–944; *Internet Access in Public Schools and Classrooms, 1994–98*, NCES 1999–017; and Fast Response Survey System, "Survey on Internet Access in U.S. Public Schools, Fall 1999," FRSS 75, 1999.

varying concentrations of poverty. Schools with the highest concentration of poverty had 16 students per instructional computer with Internet access, compared to 7 among schools with the lowest concentration of poverty.

How are public schools connecting to the Internet?

Over the years, changes have occurred in the type of network connections used by public schools and the speed at which they are able to connect. In 1996, dial-up network connections were used by almost three-quarters of public schools (not shown). By 1999, more schools were using faster dedicated-line network connections. Sixty-three percent of the nation's public schools were connected to the Internet by dedicated lines, 14 percent used dial-up connections, and 23 percent of schools used other connection types, which included ISDN, wireless connections, and cable modems (table 2). Secondary schools (77 percent) and schools with the lowest concentration of poverty (72 percent) were more likely to connect to the Internet using dedicated lines than elementary schools (60 percent) and schools with the highest concentration of poverty (50 percent).

How are public schools funding advanced telecommunications?

Measuring funding is difficult as schools receive support for advanced telecommunications programs from a myriad of sources. Because of the complexity of this issue, measuring actual funding amounts was considered beyond the scope of this survey. However, the survey did list several potential sources of support and asked whether the school received hardware, software, or funding from the sources. About 9 out of 10 public schools reported receiving support from their school district, and 72 percent from state or federal government programs (figure 1). About a third of schools reported receiving support from parents and parent organizations, and about the same percentage received support from businesses. Fifteen percent of schools received support from teachers or students while 5 percent received support from other programs or individuals (not shown). School administrators were also asked to indicate the primary source of support. Schools most frequently cited the school district (58 percent), followed by state and federal programs (32 percent). This primary support was related to the school's poverty concentration: for example, state and fed-

Table 2.—Percentage of public schools that use the following types of connections when connecting to the Internet, by school characteristics: Fall 1999

School characteristics	Types of network connections to the Internet: Dedicated line[1]	Dial-up connection	Other connection types[2]
All public schools	**63**	**14**	**23**
Instructional level[3]			
Elementary	60	15	25
Secondary	77	6	17
Size of enrollment			
Less than 300	64	21	15
300 to 999	63	12	26
1,000 or more	67	10	23
Metropolitan status			
City	62	15	23
Urban fringe	62	10	27
Town	64	13	24
Rural	66	18	16
Geographic region			
Northeast	60	16	24
Southeast	53	18	29
Central	68	14	19
West	70	9	21
Percent of students eligible for free or reduced-price school lunch			
Less than 11 percent	72	7	21
11 to 30 percent	65	10	24
31 to 49 percent	65	11	24
50 to 70 percent	63	21	17
71 percent or more	50	23	26

[1] Dedicated-line connections include T1/DS1, fractionalized T1, 56Kb, T3/DS3, and fractionalized T3 lines.

[2] Other connection types include ISDN, cable modem, wireless connections, and other types of network connections.

[3] Data for combined schools are included in the totals and in analyses by other school characteristics but are not shown separately.

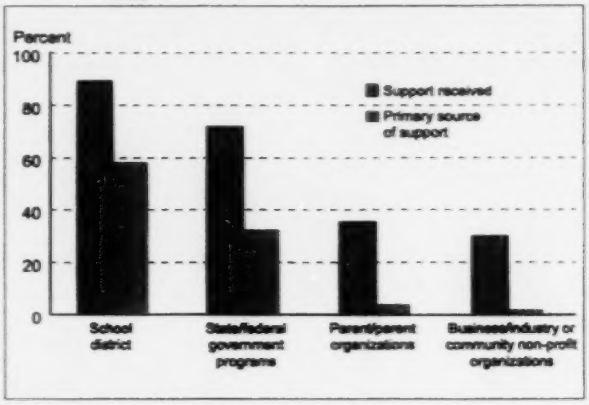
SOURCE: U.S. Department of Education, National Center for Education Statistics, Fast Response Survey System, "Survey on Internet Access in U.S. Public Schools, Fall 1999," FRSS75, 1999.

eral government programs were cited as the primary source by 48 percent of schools with the highest concentration of poverty compared to the 14 percent of schools with the lowest concentrations of poverty; the school district was the primary source for 43 percent of highest poverty schools compared to 78 percent of schools with the lowest poverty (not shown).

Related Information

This survey is part of an overall effort of NCES to track the access and use of technology in schools and classrooms. More information from the series of public school surveys on advanced telecommunications and Internet access (1995, 1996, 1997, 1998, and 1999, see references) can be obtained from the U.S. Department of Education. In addition to collecting information from public schools, NCES surveyed private schools about advanced telecommunications in 1995 and 1998 (1997 and 2000, see references). NCES has also collected information on teacher training in advanced telecommunications; a report on this topic is scheduled to be released in summer 2000.

Figure 1.—Percent of public schools that received hardware, software, or funding for advanced telecommunications from the following programs, organizations, or individuals and the primary source of support: Fall 1999



NOTE: Data were also collected for schools receiving hardware, software, or funding from teachers or students, and other sources.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Fast Response Survey System, "Survey on Internet Access in U.S. Public Schools, Fall 1999," FRSS 75, 1999.

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Stats in Brief present information on education topics of current interest. All estimates shown are based on samples and are subject to sampling variability. All differences are statistically significant at the 0.05 level. In the design, conduct, and data processing of NCES surveys, efforts are made to minimize the effects of nonsampling errors, such as item nonresponse, measurement error, data processing error, or other systematic error.

This **Stats in Brief** was prepared by Catrina Williams. To obtain standard errors or definitions of terms for this Issue Brief, or to obtain additional information about the Fast Response Survey System or the FRSS telecommunications surveys, contact Edith McArthur at NCES, 202–219–1442. To order additional copies of this Issue Brief or other NCES publications, call 1–800–424–1616. NCES publications are available on the Internet at http://www.NCES.ed.gov/pubsearch.

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